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ABSTRACT

In 1986-87, the Writing to Read (WTR) program was piloted in kindergarten classes of four elementary schools in Tampa, Florida. Under the direction of their teachers and the WTR aide, kindergartners worked in the WTR laboratory for 1 hour per day. Students moved through the five-station laboratory where they learned and practiced phonetic, reading, and writing skills. A comprehensive program evaluation was conducted to determine the degree and ease of implementation, teacher and parent perceptions, and short-term effects on students. Major findings from the first-year data indicate that: (1) the WTR program was implemented as intended at the four sites; (2) parents overwhelmingly favored the WTR program; (3) teacher response to the teacher training program was positive; (4) over 90 percent of the WTR teachers reported that their students were reading better than previous groups of students; (5) over 80 percent of the WTR teachers reported that their students were writing better than previous groups; and (6) student outcome measures strongly favored the WTR instructional group over a comparison group. (TJH)

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Annual Evaluation Report
Writing to Read Program

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EXECUTIVE SUMMARY

In 1986-87, the Writing to Read (WTR) program was piloted in kindergarten classes of four elementary schools: Oak Park, Just, Carrollwood, and Lake Magdalene. Under the direction of their teachers and the WTR aide, all kindergarteners in these schools worked in the WTR lab for one hour per day. As specified in the WTR instructional program, students moved through five stations where they learned and practiced phonetic, reading and writing skills.

In order to determine the degree and ease of implementation, teacher and parent perceptions and short-term effects on students, a comprehensive program evaluation was conducted. Major findings of the first year data collection and analysis are listed below.

- Given the usual constraints of late arrival of materials and equipment, limited instructional space, and larger numbers of kindergarten students than had been anticipated, the WTR program was implemented as intended at the four sites.

- Parents overwhelmingly favored the WTR program. Over 90 percent of those who responded to a parent survey reported that they liked the WTR program and hoped their school would continue to use the program.

- Teachers were trained to use the WTR program in the fall of 1986. Responses to the training program were very positive. Over 80 percent of the teacher group liked the WTR program and felt it was instructionally effective, especially with average and above average students. Over 90 percent of WTR teachers reported their students were reading better than previous groups of students and over 80 percent reported their students were writing better than previous groups of students. Two-thirds of the teacher group hoped their school would continue to use the program.

- Results of two student outcome measures strongly favored the WTR instructional group. On a writing sample, the WTR student group performed at a significantly higher level than students in the comparison group. On the CTBS test, the WTR student group performed significantly better on the Vocabulary subtest and Total Pre-Reading than students in the comparison group. These differences held true for every ability group. On both the writing sample and achievement test, boys in the WTR group overwhelmingly outperformed boys in the comparison group. Girls in both groups exhibited the same level of performance on the writing samples, but on the CTBS, girls in the WTR group showed better achievement than non-WTR girls.

Table of Contents

List of Tables..... ii

List of Figures..... iii

0.0 Introduction..... 1

1.0 Program Description..... 3

2.0 Evaluation Design and Methodology..... 5

2.1 Process Investigation..... 6

2.2 Product Investigation..... 7
2.2.1 Scoring the Writing Samples..... 9
2.2.2 Researching and Analyzing Reading Achievement 11

3.0 Analyses and Results..... 13

3.1 Teacher and Administrator Actions and Perceptions... 13

3.2 Parent Perceptions..... 30

3.3 Product Investigation Results..... 36

4.0 Conclusions and Recommendations..... 46

4.1 Conclusions..... 47

4.2 Recommendations..... 49

List of Tables

Table 1.	Summary of Writing to Read Participants' Levels of Use -- March 1987.....	14
Table 2.	Teacher Ratings of Initial WTR Training Session..	16
Table 3.	Teacher Opinions About the General Use of Computers in Educational Settings and the Specific Use of the WTR Program.....	18
Table 4.	Teacher Impressions and Observations of the Effectiveness of the WTR Program.....	19
Table 5.	Comparative Teacher Observations of WTR Students' Reading Instruction and Performance.....	20
Table 6.	Comparative Teacher Observations of WTR Students' Writing Instruction and Performance.....	21
Table 7.	Student Classroom Time Spent in Various Language Arts Activities.....	22
Table 8.	Parent Familiarity with the Writing to Read Program.....	31
Table 9.	Parent Impressions of the Writing to Read Program.....	32
Table 10.	Parents' Observations of Their Child's Performance.....	33
Table 11.	Parent Opinions About the General Use of Computers in Educational Programs and the Specific Use of the Writing to Read Program.....	35
Table 12.	Comparison of Writing Sample Results for WTR and non-WTR Kindergarten Students Overall, by Ability Group, By Sex, and by SES.....	38
Table 13a.	Comparison of CTBS Results for WTR and non-WTR Kindergarten Students Overall and By Ability Group.....	40
Table 13b.	Comparison of CTBS Results for WTR and non-WTR Kindergarten Students by Sex.....	42
Table 13c.	Comparison of CTBS Results for WTR and non-WTR Kindergarten Students by SES.....	43

List of Figures

Figure 1. CTBS Total Pre-Reading Percentile Ranks for Writing to Read Schools 1984-87..... 44

0.0 INTRODUCTION

Reading instruction is the primary focus of the elementary school curriculum in Hillsborough County. The following mission statement reflects the philosophy adopted by Dr. Raymond O. Shelton, School Superintendent, and his staff:

> By creating a learning environment that maximizes each student's potential, the Hillsborough County School System will develop lifelong readers who read widely for information and enjoyment. All children will be exposed to good literature through listening and reading and will develop written and oral expression competencies in all curriculum areas.

This statement of purpose served as a guide for the work done by various county personnel in formulating recommendations for improvement of reading instruction. The Hillsborough County Reading Report of 1986 gave special emphasis to intervention strategies in kindergarten which might result in a reduction in the number of students retained at the end of the first grade due to lack of satisfactory reading achievement. One such proposal was to pilot IBM's Writing to Read (WTR) program in all the kindergarten units of four schools.

The WTR program was piloted in 1986-87 at Oak Park, Carrollwood, Lake Magdalene and Just. All kindergarten students in these schools worked in the WTR lab for 55 to 60 minutes per day under the direction of their teacher, the WTR aide, and the kindergarten

aide. WTR experience began after the first marking period, and continued until the end of the school year.

Because WTR was a pilot program, an extensive evaluation was conducted. The Department of Testing and Evaluation, at the request of the Department of Elementary Education, evaluated the degree of classroom implementation and the impact of WTR on the writing performance and reading achievement of the students involved in the pilot. Educational Testing Service evaluated WTR in several school districts throughout the United States in 1982-84. While that report showed significant gains in student achievement in reading and writing, it was felt that a local evaluation through the use of a matched control group design would lead to district-specific conclusions and implications.

This document serves as a summary report for the 1986-87 WTR pilot program, and is presented in four sections: Program Description, Evaluation Design and Procedures, Analysis/Results, and Conclusions/Recommendations.

1.0 PROGRAM DESCRIPTION

The four schools selected as participants in the pilot project had very different populations. Just and Oak Park Elementary Schools are considered inner-city schools with a high concentration of low socio-economic (SES) level students. The other two elementary schools, Carrollwood and Lake Magdalene, are considered suburban schools, with mainly mid to upper-middle SES level students. These four schools volunteered to participate in the pilot and were selected at the discretion of the General Director of Elementary Education.

Writing to Read uses each child's natural language growth as the basis for instruction in writing and reading at the kindergarten and first grade levels. Dr. John Henry Martin developed WTR as an outgrowth of his research and observation of children's cognitive development. The objectives of the program are as follows:

1) Students will know the 42 phonemes found in reading.

2) Students will be able to write anything they can say.

3) Students will be able to read anything they can write.

4) Students will acquire advanced vocabulary and other language skills.

According to program developers, most children achieve these objectives at the end of two years (kindergarten and first grade) in the WTR program. As students work in the WTR lab for approximately one hour each day, they use a variety of equipment,

including IBM personal computers with speech synthesizers and various educational materials organized into five learning stations. Students move through three to five different stations each day where they learn and practice phonetic reading and writing skills. Teachers, after receiving inservice training, and with the assistance of the trained WTR lab aide, serve as the educational managers, monitoring each student's progress and assisting with individual learning needs. Those needs are determined as students progress through the program at their own pace.

WTR is marketed by IBM, and inservice training was conducted by IBM consultants. The training covered two days of instruction, and was conducted at the local IBM office on Buffalo Avenue. Training was provided for all principals, curriculum/intervention specialists, teachers, classroom aides, and WTR lab aides who participated in the project. In addition, IBM provided inservice during the implementation of the pilot as well as consultant visitations and assistance.

2.0 EVALUATION DESIGN AND METHODOLOGY

Evaluation of the WTR program followed a traditional formative-summative evaluation model in that information was collected at regular intervals to describe the manner in which WTR was delivered and the impact it had on student learning. Data were gathered from a variety of sources (including district and shcool records, teachers' and administrators' comments, parent comments, students' achievement test results and writing samples) to ascertain existing implementation status, determine perceived needs and attitudes of participant groups, and measure academic gains of students.

2.1 Process Investigation

In March 1987, all WTR teachers, aides, three principals, four curriculum/intervention specialists, and one primary specialist were interviewed by a representative of the Office of Evaluation. Questions addressed by the interview activity included the following:

- How many teachers and students are involved in the WTR program?
- What types of materials and equipment are available to teach the WTR program? Are they sufficient? Are they well organized? Are they maintained properly? Are they consumable or non-consumable?
- What types of communication/interaction opportunities are available for WTR teachers and aides?
- To what extent are teachers and aides implementing WTR?
- What concerns do teachers, aides and administrators have about WTR?
- What specific features of the WTR program are considered most effective? least effective?
- What are teachers', aides' and administrators' attitudes toward the WTR program?
- In what types of facilities is the WTR program laboratory housed? Are the facilities adequate? Are they maintained properly? Are they accessible when necessary? Who is responsible for the facilities?
- What types of training activities are offered to WTR teachers and aides? Are they adequate? Are all teachers and aides trained? Who provides the training? Are follow-up sessions included in the training?

Five independent contractors under the direction of the Office of Evaluation were trained to conduct Levels of Use (LoU) interviews with teachers and WTR aides and to ask a set of program-specific questions to other participants (i.e., principals, CISs, PSs). All interviews were conducted on the same day; each was individually administered and lasted approximately 30 minutes. After the interviews were completed data were analyzed in two ways. First, a frequency table which showed teachers' and WTR aides' level of program implementation was generated. Then, qualitative program information (i.e., perceived strengths, weaknesses, concerns and suggestions) was summarized in brief narrative style. Findings were shared with appropriate personnel in mid-March 1987.

2.2 Product Investigation

Program impact questions focused on the academic gains in reading and writing skills made by students in the WTR program. It was intended that nine specific questions be addressed by the study. The total group of WTR students and subgroups categorized by sex, ability level, and SES were examined.

1) When compared with a group of students not using the WTR program, will WTR students perform better on writing tasks?

2) When compared with a group of students not using the WTR program, will WTR students perform better on reading tasks?

3) When compared with a group of similar low ability students, will WTR students perform better on reading achievement tests and writing tasks?

4) When compared with a group of similar average ability students, will WTR students perform better on reading achievement tests and writing tasks?

5) When compared with a group of similar high ability students, will WTR students perform better on reading achievement tests and writing tasks?

6) When compared with a group of similar males, will WTR male students perform better on reading achievement tests and writing tasks?

7) When compared with a group of similar females, will WTR female students perform better on reading achievement tests and writing tasks?

8) When compared with a group of similar low SES students, will WTR students perform better on reading achievement tests and writing tasks?

9) When compared with a group of similar middle SES students, will WTR students perform better on reading achievement tests and writing tasks?

For the product investigation, comparison schools were selected which had approximately the same percentage of students on free or reduced price lunch as the WTR pilot schools. WTR teachers and kindergarten teachers in comparison schools completed a class roster which requested information on each student's birthdate, sex, race, lunch status, and Dallas (test of developmental readiness) score. From these data, 90 WTR students and a matched group of 90 comparison students were identified. The sample reflected an equal number of students with low, average and high Dallas scores, in addition to being matched on other criteria. It should be noted that the sample reflected an equal number of boys and girls. There was no communication with any of the schools involved concerning which individual students had been selected as part of the sample.

In May 1987, all WTR and comparison students submitted a writing sample. The topic and procedures for the sample completion matched those developed by the IBM evaluation team. A team of raters was trained in the use of a dual-reader resolution scoring model, and the writing samples were scored. Inter-rater reliability checks were made during the scoring process. Results of the writing sample scores from WTR and comparison students were compared using a Mann-Whitney U test. Significance levels were set at p .05 for all analyses.

Also in May 1987, all kindergarten students in the district were administered the Comprehensive Test of Basic Skills (CTBS) (Form U, Level A). Vocabulary, oral comprehension, and total pre-reading CTBS scores were researched for each WTR and comparison student and, using non-parametric and parametric tests, statistical analyses were conducted. In response to the product questions, breakdowns of writing scores and CTBS scores were performed for total program, by sex, by lunch status (SES), and by ability level (Dallas score).

2.2.1 Scoring the Writing Samples

Writing samples were scored using the 7-point scale developed by the WTR national evaluation team. Each sample was read by two readers who assigned a score of 0 to 6 to each paper. ("0" constituted the low end of the scale.) The training and scoring sessions were conducted on June 25 and 26, 1987 by Dr. Judy Crosby, from the University of South Florida. The raters were five primary teachers from the district who had experience with the Developmental Writing Program, but who were not members of the WTR faculty or comparison school faculty. The raters were not informed of the specific purpose of the scoring (i.e., WTR evaluation) until after the scoring had been completed. The Supervisor of Evaluation prepared a logistics document to guide all paper preparation and other scoring-related activities. The logistics document provided instructions for the following activities:

1) Randomly selecting papers from each of the groups to be included in the scoring sample.

2) Recording a three-digit numerical code on each paper, then removing all identifying information from the paper.

3) Scrambling paper order to interrupt all unit clusters.

4) Pre-coding a scoring form for each paper.

5) Preparing scoring packets that contained a designated number of papers and their corresponding scoring forms.

6) Preparing ancillary materials for the scoring session.

The logistics document also detailed procedures and staff responsibilities for training, scoring, and recording results.

Dr. Crosby spent considerable time training the five raters to score the writing samples according to a common standard. Even though they teach writing, teachers do not always grade or score students' papers by the same priorities. Some teachers place great emphasis on neatness. Some are concerned with the structural correctness of sentences; others are more concerned with the richness of language. Some teachers place greater emphasis on a paper's content; others focus on a paper's form. These different approaches can cause considerable disagreement among raters as to the score that a given paper should receive, thereby resulting in unreliable and invalid scores.

To counteract the influences of these conflicting priorities during scoring activities, a single standard, established by expert judges (or, in this case, the commercial program) is established in advance through pre-scoring activities. Pre-scoring is done to establish and/or refine the standard for all ensuing scoring and to ensure the validity both of the process and of the scores ultimately given to each paper. During pre-scoring, a team of expert judges (i.e., the Supervisor of Evaluation, the consultant, and a CIS) who were knowledgeable of the writing stages

and standard to be used, scored, discussed, and rescored until they reached agreement about the final score on a large number of papers. These pre-scored papers were then used to train the five raters and to provide a stable measure for periodic reliability checks. Raters studied the training papers, along with the score scale, early in the training process. Reliability check papers were used twice during the scoring process to ensure that raters had not strayed from the standard score scale.

It should be noted that none of the pre-scored papers were actual writing samples of specific students identified as part of the evaluation sample.

Raters were told they would be scoring papers written by kindergarten students in the district. Each rater had a copy of the Scoring Procedures Manual which was carefully reviewed by the consultant.

During the actual scoring sessions, raters were given packets of six papers to score. After assigning a score, the rater affixed a "Write Guard" patch which covered the assigned score before the paper was scored by a second reader. After the second rater scored a packet, the packet was given to the consultant who then revealed the actual scores assigned by both raters. Where scores differed by only one or two points, an average was taken. Thus, a "4" and a "5" yielded a final score of "4.5". Where the scores were more than one point apart, the paper was read by a third rater, who was not aware of the two previous scores assigned to the paper. The score assigned by the third rater was the one recorded for that paper.

2.2.2 Researching and Analyzing Reading Achievement

CTBS data were available for analyses in August 1987. Class Record Sheets for each of the WTR and comparison schools were used to obtain scores for the specific students identified as part of the sample. Scale scores for vocabulary, oral comprehension, and total pre-reading were recorded for each kindergarten student in the sample. Students were omitted from the sample if they did not have both a CTBS score and a writing sample score. This resulted in the loss of approximately twenty students from the sample, with approximately the same number from WTR schools as comparison schools.

Scores were placed into a computer data file and subjected to various statistical analyses from the Statistical Package for the Social Sciences, tenth edition (SPSS-X).

3.0 ANALYSES/RESULTS

3.1 Teacher and Administrator Actions and Perceptions

To ascertain the degree of implementation of WTR and to provide feedback to program supervisors, surveys and interviews were used with the various participants. Table 1 depicts the level of program implementation for the 21 WTR teachers and aides. As shown, all were indeed implementing the WTR program as intended. Five of the 21 were classified as "Mechanical Users" because they had major concerns about space, instructional time, materials organization, pacing, management of centers, and/or equipment usage. Sixteen participants were classified as "Routine Users" because they appeared to be progressing through the program at a steady pace with a minimum of expressed difficulties. After approximately three months into the pilot project, about three-fourths of the participant group seemed to be stable users of the program.

Table 1. Summary of Writing to Read Participants' Levels of Use March 1987

	Levels of Use	Number of Respondents Per Level
NON-USE	LEVEL 0 Non-Use: State in which the user has little or no knowledge of the innovation, no involvement with the innovation, and is doing nothing toward becoming involved.	0
	LEVEL I Orientation: State in which the user has acquired or is acquiring information about the innovation and/or has explored or is exploring its value orientation and its demands upon the user and user system.	0
	LEVEL II Preparation: State in which the user is preparing for first use of the innovation.	0
USE	LEVEL III Mechanical Use: State in which the user focuses most effort on the short-term, day-to-day use of the innovation with little time for reflection. Changes in use are made more to meet user needs than client needs. The user is primarily engaged in a stepwise attempt to master the tasks required to use the innovation, often resulting in disjointed and superficial use.	5
	LEVEL IVA Routine: Use of the innovation is stabilized. Few if any changes are made in ongoing use. Little preparation or thought is being given to improving innovation use or its consequences.	16
	LEVEL IVB Refinement: State in which the user varies the use of the innovation to increase the impact on clients within immediate sphere of influence. Variations are based on knowledge of both short- and long-term consequences for clients.	0
	LEVEL V Integration: State in which the user is combining own efforts to use the innovation with related activities of colleagues to achieve a collective impact on clients within their common sphere of influence.	0
	LEVEL VI Renewal: State in which the user reevaluates the quality of use of the innovation, seeks major modifications of or alternatives to present innovation to achieve increased impact on clients. Examines new developments in the field, and explores new goals for self and system.	0

In general, the Writing to Read (WTR) pilot teacher group consisted of experienced teachers; most (87 percent) had taught for five years or more. No teacher in the group had previously used the WTR program. Class sizes in the WTR classrooms ranged from 16 to 29 students with an average teacher-pupil ratio of 1:24.6. (The class with 16 students is the transitional first grade class in the pilot.)

As designed, the WTR program was used for one hour per day to supplement the district's kindergarten readiness program. All kindergarten pilot teachers reported using the Alpha Time program. Two-thirds of the kindergarten pilot group used Alpha Time, readiness portions of the Macmillan reading program, and WTR. Teachers stated that time spent in WTR instruction had previously been set aside for instruction in science, social studies, finger plays, art and/or music. Several teachers commented that these areas of the curriculum had been neglected because of their participation in the WTR program.

Tables 2-7 provide information regarding the WTR teachers' impressions of their initial training session and their opinions about the effectiveness of the WTR program. As shown in table 2, the first training session was given above average ratings. Several teachers made the following suggestions for future training activities.

- Provide training sessions closer to the time of initial implementation than was done this past year. Maintain the content and personnel of the first training sessions. Modify the second training session (the one offered on Professional Study Day), especially the afternoon session. Consider rescheduling the follow-up session so that it occurs about one month to six weeks after participants first begin to implement the program.

Table 2. Teacher Ratings of Initial WTR Training Session

Statement	Range and Median Score
A clear statement of the purpose of the workshop was made.	3 — 4.73 — 5
Objectives were clearly stated at the outset.	3 — 4.66 — 5
Content level was appropriate for me.	4 — 4.80 — 5
Instruction was effective.	2 — 4.33 — 5
Appropriate opportunity was given for sharing ideas and/or questions.	2 — 4.13 — 5
Instructors responded readily to group needs.	3 — 4.66 — 5
Adequate materials were supplied.	1 — 4.20 — 5
The program was keyed to my important concerns.	1 — 3.66 — 5
I was able to apply what I learned in my work setting.	2 — 4.13 — 5
Overall, I was satisfied with the inservice training experience.	2 — 3.93 — 5

Teacher opinions about the use of computers with kindergarten children are mostly positive. As shown in table 3, over 90 percent of the WTR teacher group felt that it's appropriate and important for young children to learn about computers and to use computers in learning. At least 80 percent (see table 4) of WTR teachers liked the program and rated it effective for their students. More teachers felt the program was effective for above average and average students than for below average students. As shown in tables 5, 6, and 7 teachers reportedly spent more time in 1986-87 on reading and writing activities than they had in previous years. Consequently, they perceived their students to be better readers and writers than previous groups of children they had instructed.

Table 3. Teacher Opinions About the General Use of Computers in Educational Settings and the Specific Use of the WTR Program

Statement	Percentage (N) of Respondents Who:		
	Agreed	Disagreed	Were Not Sure
It is important today that children learn about computers and how to use them.	93.3% (14)	---	6.7% (1)
Money being spent on computers should be spent on other things.	13.3% (2)	80.0% (12)	6.7% (1)
Children this age are too young to learn by computers.	---	100.0% (15)	---
The children are progressing as well as expected.	93.3% (14)	6.7% (1)	---
Too much time is spent on Writing to Read.	13.3% (2)	80.0% (12)	6.7% (1)
I hope our school will continue to use Writing to Read.	66.6% (10)	6.7% (1)	26.6% (4)

Table 4. Teacher Impressions and Observations of the Effectiveness of the WTR Program

	Response Category	Percentage (N) of Respondents
How do you feel about the WTR program?	Like it very much	33.3% (5)
	Like it	46.7% (7)
	Not sure	20.0% (3)
	Dislike it	---
	Dislike it very much	---

	Response Category	Percentage (N) of Respondents
How would you rate its overall effectiveness?	Very effective	20.0% (3)
	Effective	66.7% (10)
	Not Sure	13.3% (2)
	Ineffective	---
	Very ineffective	---

		Percentage (N) of Respondents		
	Response Category	Above Average	Average	Below Average
How would you rate the effectiveness of the WTR on the following types of children?	Very effective	60.0% (9)	33.3% (5)	6.7% (1)
	Effective	40.0% (6)	66.7% (10)	46.7% (7)
	Not sure	---	---	33.3% (5)
	Ineffective	---	---	13.3% (2)
	Very ineffective	---	---	---

Table 5. Comparative Teacher Observations of WTR Students' Reading Instruction and Performance

		Percentage (N) of Respondents
How does the amount of time you spend on reading compare with the amount you spent in previous years?	Am spending more time on reading than in previous years	80.0% (12)
	Am spending about the same amount of time as in previous years	13.3% (2)
	Am spending less time on reading than in previous years	---
	Not applicable (my first year teaching at this level)	6.7% (1)
	Have no opinion	---

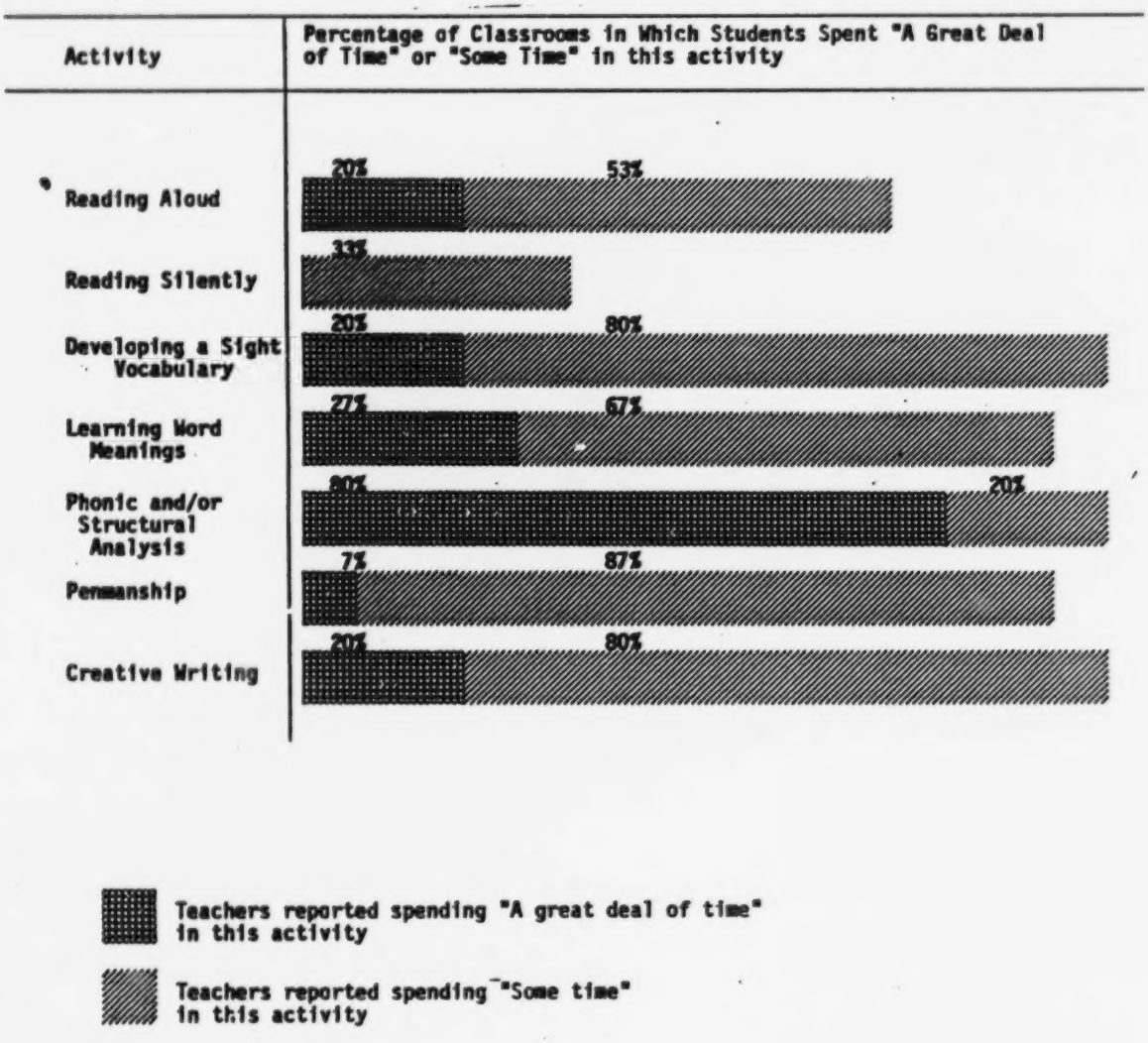
		Percentage (N) of Respondents
How do you think the progress in reading of most of your students compares to the progress in reading of your students in previous years?	Are reading better than students in previous classes	93.3% (14)
	Are reading about the same as students in previous classes	---
	Are not reading as well as students in previous years	---
	This is my first year teaching at this grade level.	6.7% (1)
	Have no opinion	---

Table 6. Comparative Teacher Observations of WTR Students' Writing Instruction and Performance

		Percentage (N) of Respondents
How does the amount of time you spend on writing compare with the amount you spent in previous years?	Am spending more time on writing than in previous years	80.0% (12)
	Am spending about the same amount of time as in previous years	13.3% (2)
	Am spending less time on writing than in previous years	---
	Not applicable (my first year teaching at this level)	6.7% (1)
	Have no opinion	---

		Percentage (N) of Respondents
How do you think the progress in writing of most of your students compares to the progress in writing of your students in previous years?	Are writing better than students in previous classes	86.6% (13)
	Are writing about the same as students in previous classes	6.7% (1)
	Are not writing as well as students in previous years	---
	This is my first year teaching at this grade level.	6.7% (1)
	Have no opinion	---

Table 7. Student Classroom Time Spent in Various Language Arts Activities



Almost all teachers, aides and administrators expressed support for the program and stated that their students appeared to be benefitting from it. Although some site-specific problems existed, they seemed related to school or personnel constraints rather than major program limitations.

Reported strengths were many and related principally to student gains in reading and writing skills. As teachers and/or administrators stated them, positive aspects of the WTR program are listed below.

- Students are learning all sounds (i.e., the 42 phonemes) and 30 sight words.
- Students are motivated to write and read daily.
- Students are aware of and practice the integration of reading, writing, and spelling.
- Student-student interaction is frequent and supportive. Peer partnerships allow students to interact in a purposeful and positive way.
- Students operate independently and are well-organized and business-like in the lab. Thus, few discipline problems exist during lab time.
- Students are becoming computer literate.
- Students' self-concept and confidence have been enhanced.
- Students understand blending of sounds and apply this knowledge in their reading and writing.
- Students can move at their own pace through the computer software cycles.
- Students are learning the alphabet more quickly than in previous years.
- Students' listening skills and attentiveness are improved.
- Students of low ability can be successful in the program, and can be given opportunities for review if mastery does not occur after the first preparation.

- Students are free to take risks, both at the computer and in their personal writing.
- Parents are enthusiastic about the program and support it.
- Teachers have an opportunity to interact with each child every day at the writing station.
- The program is multi-sensory and provides stimulation for various learning styles.
- Materials are well organized; many are self-monitoring. They can be easily integrated with other curriculum components such as Alpha Time.
- A variety of hands-on materials are provided to promote "learning by doing".
- The program teaches the child responsibility for his/her own learning.
- WTR tunes into children's fantasies and provides a vehicle by which thought processes are stimulated and language expression can take place.

Reported weaknesses revolved around the need for a revised recordkeeping system, the amount (and accompanying expense) of expendable paper and markers required for the program, the need for additional software before, during and after the ten-cycle program core, and the limited and unclear information in the teacher manual. More detailed explanations of program weaknesses are given below.

- The present weekly management system requires that teachers collect five papers per week from each student. At the end of the week, the teacher reads all five papers, chooses the "best" one, ranks it on the WTR rating scale, and records the information on a class record sheet. Teachers complained that this process takes about one and one-half to two hours per week. They questioned the need for weekly review and stated that a less frequent record would suffice.

- Several stations in the WTR lab require blank paper and magic markers. Each student in the lab uses at least one sheet of blank paper per day and is encouraged to draw and write in different marker colors. The cost of these consumable materials adds up quickly and schools must purchase these additional items from their local budgets. One principal reported spending over $600.00 thus far for expendable items. Schools such as Lake Magdalene where 165 students go through the lab per day use about 3,500 sheets of paper per month and lots of magic markers.

- All teachers reported that students who are developmentally ready move well through the program. However, each school had some students in the kindergarten program who in November were not ready for the first cycle of the WTR software. Teachers felt that these students should begin instruction on readiness software programs, then move into the WTR program as they develop adequate readiness skills. Other students make adequate progress in some parts of the program, but "get stuck" on particular lessons or cycles. Teachers felt that merely repeating the same software content was unacceptable for some students, and that alternative or branching programs should be available for students in this situation. A few teachers suggested that these alternative programs be available after cycles 4 and 7.

- Students who complete the ten-cycle software program were trained to use an introductory word processing program. Although teachers approve of this extension, procedures for instituting it are less structured and less organized than the core program to which the student had grown accustomed. Teachers felt that this program extension should have been integrated into the program in a more organized manner, and that software to institute it should have been provided in a more timely manner.

- According to most WTR teachers and aides, the existing manual is incomplete. Although respondents agreed that it provides a good overview of the program, few were able to use it as a program guide or to locate answers to specific questions that arose. The WTR aide at Lake Magdalene reviewed the manual in-depth and is prepared to offer suggestions for its improvement.

Site-specific problems which arose included the following.

- At Just, about ten students (of 62) were not able to participate in the program because of their need for continued readiness.

- At Oak Park, computer equipment was a problem. The lab was housed in the middle of the media center. Students apparently bumped against the back of the computers and loosened the cable which connects several critical elements. When this occurred, an IBM repairman was called. While these calls for assistance were responded to quickly, breaks happened repeatedly and fewer than five computers were available for instruction.

- At Lake Magdalene, the large number of students in the kindergarten prohibited teachers and students from experiencing a full hour each day in the lab. Space was limited so all three adults could not be present in the lab simultaneously.

- At Carrollwood, the WTR aide and kindergarten teacher instructed half of each class in the lab while the kindergarten aide supervised the remaining half in the regular classroom. This posed an instructional time problem for the kindergarten teacher who spent two hours per day in the computer lab.

In addition to the weaknesses already stated, most teachers felt that beginning the WTR program during the first semester was a mistake. They favored beginning-to-mid-January as a starting point.

Several concerns were expressed by respondents. Reported concerns could be classified as philosophical, managerial, or future-oriented. A couple of kindergarten teachers who were interviewed stated that they approved of the kindergarten program's existing philosophy, which is essentially Piagetian. They expressed concern that the Writing to Read program's academic focus was contrary to their notions of what appropriate early childhood programs should emphasize. Noting that they had observed several children in their classes to experience failure in the WTR program (in that they had to "recycle" on some of the software activities), they questioned the need

to introduce this harsh reality at such an early age. These teachers also embraced the present Alpha-Time readiness program and were somewhat afraid that WTR would replace it as the kindergarten program's language arts component. In addition, one teacher wondered whether young children should spend 15 minutes per day interacting solely with a piece of electronic equipment (i.e., a computer).

Managerially, some teachers had concerns about where the lab was placed in their school, when the best time of the school year to start the program would be, how to teach students not to abuse the lab equipment, and how to fit other activities into the school day now that students spent one hour per day in the WTR lab. Some teachers were uncertain as to whether students should be required to write something everyday, and did not want to place kindergarten students under pressure to do so.

By far, the most frequently expressed concern related to the issue of what would happen to WTR children when they reached first grade. Average and above average students who progressed easily through the ten software cycles and who, currently, are able to write and read short stories are (according to experienced kindergarten teachers) significantly better writers and readers than previous groups of students they had instructed. They were concerned that first grade teachers who receive these students in the 1987-88 school year would recognize and continue to nurture these talents. Suggestions that first grade teachers be trained to emphasize writing instruction and to consider higher reading placements than usual were heard frequently.

Many suggestions for improving the WTR program were voiced by respondents. The following list includes most of these recommendations.

- Consider beginning the WTR program in January of the kindergarten year.

- Provide training sessions closer to the time of initial implementation than was done this year. Maintain the content and personnel of the first training sessions. Modify the second training session (the one offered on Professional Study Day), especially the afternoon session. Consider rescheduling the follow-up session so that it occurs about one month to six weeks after participants first begin to implement the program.

- Revise the existing manual so that it serves as a daily guide and as a resource for specific questions. Take care to include a full explanation of the recycling procedure.

- Provide several opportunities for participants to meet and share information about the program with those at other schools and the district level.

- Identify some appropriate readiness software for students who are not ready to begin the WTR program with the rest of the class. Titles such as "Get Set" and "Busy Bee" were suggested by teachers.

- Identify a structured procedure and software package for students who complete cycle 10 and are read to continue with word processing and extended writing skills.

- Revise the present management and recordkeeping system from a weekly to a lengthier interval system. Consider designing a software package to organize student placement and monitoring.

- Tapes should be run at a faster pace. (Note: Apparently IBM has corrected this problem; schools need to send in their old tapes for replacements.)

- Additional software should be available for the recycling process. Alternate cycles (such as 4-A, 4-B, 7-A, 7-B) should be included in the program so that students who must recycle several times will be exposed to slightly different material. These materials could also be used for spaced review.

- Students who must recycle should be given a new work journal rather than a used one.

° Prior to starting the program, instruct students in care of equipment and the importance of having all computers available at all times.

° For some schools that experience difficulties with equipment breakage because of student-caused damage, consider building a small guard box around the area where the cord is connected to the body of the computer.

° WTR aides should be hired based on background experiences with computers and small children. Aides should be responsible to the CIS or principal and should be included in all training activities with the teacher teams. Time should be set aside for teachers and WTR aides to interact and to set schedules and priorities. (Note: Carrollwood school specified WTR aide responsibilities and teacher responsibilities for the WTR program. A copy is available from the CIS.)

° In scheduled training sessions, inform first grade teachers of the WTR program and its effects on students. Train first grade teachers to provide structured writing opportunities for students and to watch for increased reading competence.

° When considering expansion of the WTR program district-wide, give first priority to the schools in the Lake Magdalene and Carrollwood feeder patterns.

° Give special budgetary consideration to WTR schools for expendable materials. (Check with principals at the four WTR schools to determine a reasonable amount.)

° Provide electric ball-style typewriters for the the writing-typing station. The revolving ball does not jam as students type their stories. Manual typewriters are unacceptable for young children.

3.2 Parent Perceptions

Tables 8-11 represent responses from 341 parents of students who participated in the WTR program. Approximately 90 percent of involved parents at the four pilot schools responded to a short take-home survey soliciting opinions about WTR. Over 90 percent of the responding parents were familiar with the WTR program in which their child participated and felt positively about it. Almost all respondents felt their child liked the program and had seen evidence around the home of their child's reading and writing skills. Parents expressed overwhelmingly positive feelings about their child's use of computers at school and hoped the WTR program would continue to be used.

Table 8. Parent Familiarity with the Writing to Read Program

	Response	Percentage (N) of Respondents
Are you familiar with the Writing to Read program being used in your child's class?	Yes	93.8% (320)
	No	3.8% (13)
	No Response	2.4% (8)
	Total Respondents	(341)

	Response Category	Percentage (N) of Respondents*
How did you learn about the Writing to Read program?	By talking with my child.	82% (278)
	By talking with my child's teacher	65% (223)
	By talking with other parents	20% (69)
	By visiting the school	44% (151)
	The school sent me a notice about it.	53% (181)

* Note: Parents were asked to check as many responses as applied to their situation.

Table 9. Parent Impressions of the Writing to Read Program

	Response	Percentage (N) of Respondents
How do you feel about the Writing to Read program?	Like it very much.	69.7% (238)
	Like it.	22.1% (75)
	Not sure.	7.1% (24)
	Dislike it.	.3% (1)
	Dislike it very much.	---
	No Response	.8% (3)
	Total Respondents	(341)

	Response	Percentage (N) of Respondents
How do you think your child feels about the Writing to Read program?	Likes it very much.	83.5% (285)
	Likes it somewhat.	12.9% (44)
	I don't know.	2.4% (8)
	Doesn't seem to like it.	.3% (1)
	Doesn't like it at all.	.3% (1)
	No Response	.6% (2)
	Total Respondents	(341)

Table 10. Parents' Observations of Their Child's Performance

	Response Category	Percentage (N) of Respondents*
What evidence of your child's reading and writing skills have you seen at home?	Leaves notes around the house.	56.2% (191)
	Reads signs, labels, books, other materials.	78.6% (268)
	Wants to do his/her own reading.	63.2% (215)
	Wants to read to other people.	59.7% (203)
	Brings home written words and stories.	65.9% (225)
	Shares school work and wants to read it.	78.2% (267)

* Note: Parents were asked to check as many responses as applied to their situation.

	Response Category	Percentage (N) of Respondents
How do you think your child's progress in reading compares to your other children's at this grade level?	Is doing better than my older children did.	22.1% (75)
	Reads about the same as my older children did.	12.6% (43)
	Is doing as well as my other children did.	3.5% (12)
	Have no opinion.	2.4% (8)
	This is my first child at this grade level.	59.4% (203)
	Total Respondents	(341)

Table 10 (cont.). Parents' Observations of Their Child's Performance

	Response Category	Percentage (N) of Respondents
How do you think your child's progress in writing compares to your other children's at this grade level?	Is doing better than my older children did.	22.9% (78)
	Reads about the same as my older children did.	10.9% (37)
	Is doing as well as my older children did.	5.0% (17)
	Have no opinion.	1.5% (5)
	This is my first child at this grade level.	58.2% (199)
	No Response	1.5% (5)
	Total Respondents	(341)

Table 11. Parent Opinions About the General Use of Computers in Educational Programs and the Specific Use of the Writing to Read Program

Statement	Percentage (N) of Respondents Who: Agreed	Disagreed	Were Not Sure	Gave No Response
It is important today that children learn about computers and how to use them as soon as possible.	94.7% (323)	2.6% (9)	1.2% (4)	1.2% (4)
The money spent on computers should be spent on other things.	2.6% (9)	91.2% (311)	2.4% (8)	3.8% (13)
Children at this age are much too young to learn by computers.	5.0% (17)	93.8% (320)	---	1.2% (4)
Too much class time is spent on Writing to Read.	2.6% (9)	93.8% (320)	2.4% (8)	1.2% (4)
I hope our school will continue to use the Writing to Read program being used this year.	94.4% (322)	2.0% (7)	1.8% (6)	1.8% (6)

3.3 Product Investigation Results

Two primary questions and seven subgroup questions constituted the product portion of the evaluation. To respond to these questions, the following procedures took place:

- All students completed a writing sample, given the same story stem. A seven-point rating scale was used by raters trained in the dual-reader resolution model for scoring writing samples.
- CTBS scores in vocabulary, oral comprehension and total pre-reading were researched and compared for the students in the sample.

Each primary question and its results will be presented in this section. Relevant subquestions will be discussed under each primary question.

> When compared with a group of students not using the WTR program, will WTR students perform better on writing tasks?

As table 12 indicates, the total group of WTR kindergarten students wrote significantly better writing samples than their non-WTR counterparts. Average writing stage for the WTR group was 2.71 compared to 1.34 for the non-WTR group. A breakdown by ability group, sex category and SES category also is shown in the table. Significantly better writing performance for the WTR group held true across all ability groups, for males, and for the middle SES category. Due to the small sample size (N = 10 [WTR] and 8 [non-WTR]) for whom data were available in the low SES category, no conclusions can be drawn at this time.

It appears that females in the non-WTR group performed at the same level as females in the WTR group. In contrast, it seems that male's writing abilities are significantly enhanced as a result of the WTR program. When comparing performance of males and females within the WTR group, no significant difference is observed in writing ability. When comparing performance of males and females within the comparison group, female students significantly outperform male students.

Table 12. Comparison of Writing Sample Results for WTR and non-WTR Kindergarten Students Overall, by Ability Group, By Sex and By SES

	Average Score	Standard Deviation	T value	Probability
Total Group				
WTR (N = 72)	2.71	1.79	4.85	.000*
non-WTR (N = 72)	1.34	1.60		
Low Ability				
WTR (N = 18)	1.50	1.41	2.67	.014*
non-WTR (N = 20)	.55	.56		
Average Ability				
WTR (N = 29)	2.59	1.54	4.50	.000*
non-WTR (N = 24)	.85	1.26		
High Ability				
WTR (N = 24)	3.74	1.75	2.76	.008*
non-WTR (N = 27)	2.35	1.87		
Males				
WTR (N = 34)	2.87	1.71	6.70	.000*
non-WTR (N = 37)	.63	.97		
Females				
WTR (N = 38)	2.58	1.87	1.10	.276
non-WTR (N = 34)	2.10	1.81		
Low SES				
WTR (N = 10)	1.15	1.31	.51	.625
non-WTR (N = 8)	.93	.17		
Mid SES				
WTR (N = 62)	2.96	1.73	5.51	.000*
non-WTR (N = 63)	1.39	1.69		

* This difference is statistically significant.

When compared with a group of students not using the WTR program, will WTR students perform better on reading tasks?

As table 13 indicates, the total group of WTR kindergarten students performed significantly better in vocabulary knowledge and total pre-reading knowledge than their non-WTR counterparts. Average scale score for the WTR group on the vocabulary subtest was 431.04 (or the 89th percentile rank) compared to 389.62 (or the 78th percentile rank) for the non-WTR group. On total pre-reading, WTR students averaged 445.35 (or the 87th percentile rank) compared to 412.67 (or the 79th percentile rank) for the non-WTR students.

For the ability subgroups: low ability WTR students scored better than non-WTR students in vocabulary; average ability WTR students scored better in vocabulary and total pre-reading; high ability WTR students scored better in vocabulary.

WTR males outscored non-WTR males on all three subtests. WTR females scored better than non-WTR females on the vocabulary subtest.

In the mid-SES category, WTR students performed better than non-WTR students in vocabulary and total pre-reading. Once again, a small sample size for the low-SES category prevented any definitive conclusions for that group. However, figure 1 provides a by-school breakdown on the total pre-reading score for each WTR school for the last four years. As shown, students at Just and Oak Park scored in a consistent manner for the three years prior to the WTR intervention. After the WTR program, kindergarteners gained an average of 12 percentile ranks at Just and 21 percentile ranks at Oak Park -- impressive gains for low-SES schools.

Table 13a. Comparison of CTBS Results for WTR and non-WTR Kindergarten Students Overall and by Ability Group

		TOTAL GROUP			
		Average Scale Score	Standard Deviation	T value	Probability
Vocabulary Subtest	WTR (N = 74)	431.04	64.93	3.83	.000*
	non-WTR (N = 77)	389.62	67.93		
Oral Comprehension Subtest	WTR	458.76	122.56	1.18	.240
	non-WTR	435.01	124.67		
Total Pre-Reading	WTR	445.35	84.54	2.34	.021*
	non-WTR	412.67	87.31		

		LOW ABILITY			
		Average Scale Score	Standard Deviation	T value	Probability
Vocabulary Subtest	WTR (N = 20)	366.95	81.17	2.05	.05*
	non-WTR (N = 21)	321.86	58.22		
Oral Comprehension Subtest	WTR	341.55	98.47	.41	.68
	non-WTR	329.48	89.78		
Total Pre-Reading	WTR	354.60	78.27	1.30	.20
	non-WTR	325.95	61.73		

Table 13a(cont.). Comparison of CTBS Results for WTR and non-WTR Kindergarten Students Overall and by Ability Group

		AVERAGE ABILITY			
		Average Scale Score	Standard Deviation	T value	Probability
Vocabulary Subtest	WTR (N = 30)	440.80	43.95	4.60	.000*
	non-WTR (N = 29)	384.55	50.28		
Oral Comprehension Subtest	WTR	466.53	94.85	1.43	.161
	non-WTR	428.03	112.02		
Total Pre-Reading	WTR	454.10	54.72	3.02	.004*
	non-WTR	406.62	65.85		

		HIGH ABILITY			
		Average Scale Score	Standard Deviation	T value	Probability
Vocabulary Subtest	WTR (N = 28)	472.25	8.57	3.84	.000*
	non-WTR (N = 27)	447.78	30.13		
Oral Comprehension Subtest	WTR	546.72	90.70	.87	.391
	non-WTR	524.59	91.28		
Total Pre-Reading	WTR	510.04	47.14	1.64	.104
	non-WTR	486.63	53.74		

Table 13b. Comparison of CTBS Results for WTR and non-WTR Kindergarten Students by Sex

		MALES			
		Average Scale Score	Standard Deviation	T value	Probability
Vocabulary Subtest	WTR (N = 36)	421.25	75.84	2.70	.009*
	non-WTR (N = 38)	374.94	71.71		
Oral Comprehension Subtest	WTR	456.47	137.35	2.26	.027*
	non-WTR	392.24	104.09		
Total Pre-Reading	WTR	439.36	97.26	2.66	.010*
	non-WTR	383.92	80.85		

		FEMALES			
		Average Scale Score	Standard Deviation	T value	Probability
Vocabulary Subtest	WTR (N = 38)	440.31	51.91	2.78	.007*
	non-WTR (N = 39)	403.92	62.22		
Oral Comprehension Subtest	WTR	460.92	108.53	-.58	.565
	non-WTR	476.69	130.08		
Total Pre-Reading	WTR	451.03	71.32	.58	.565
	non-WTR	440.69	85.14		

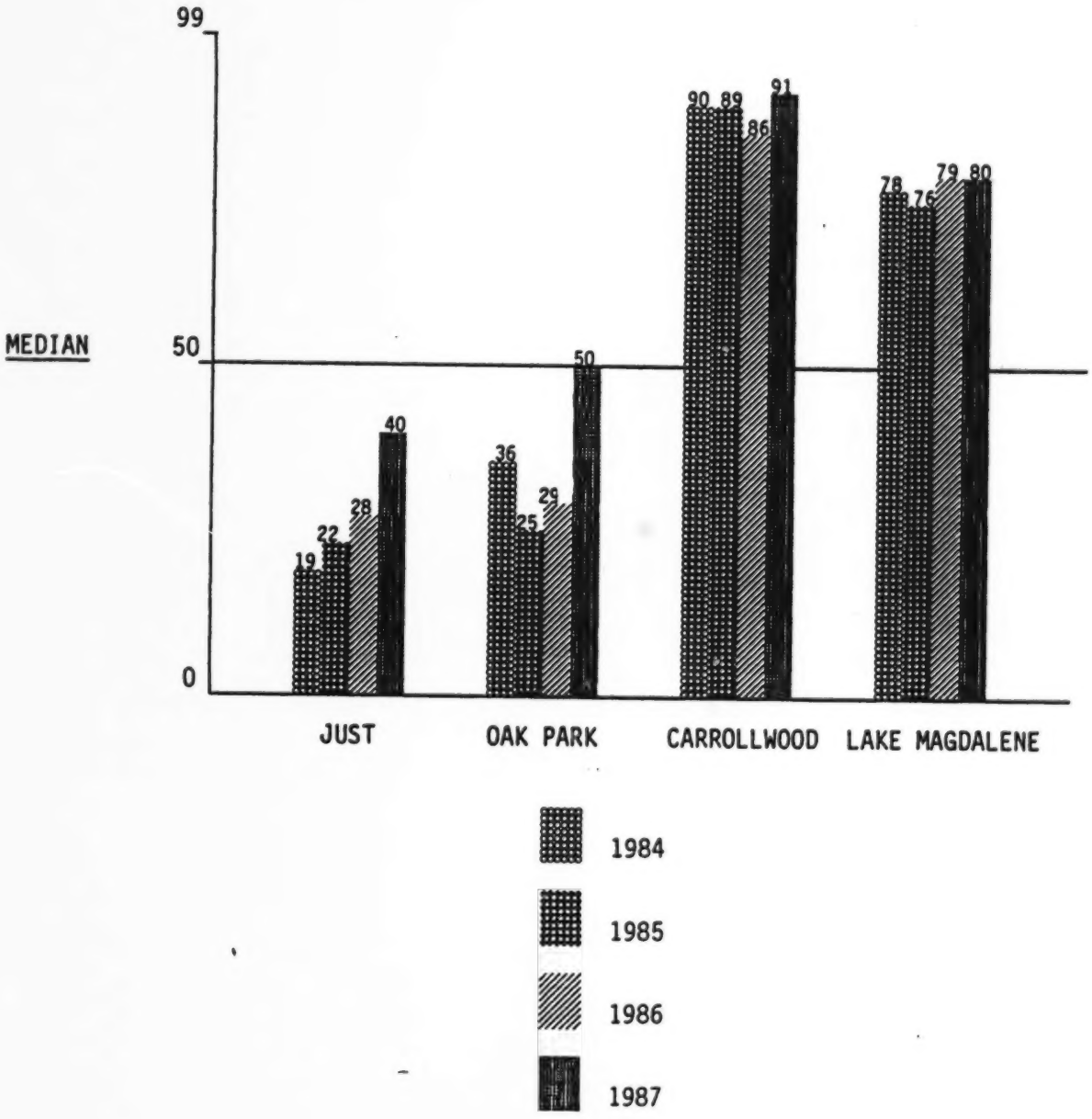
Table 13c. Comparison of CTBS Results for WTR and non-WTR Kindergarten Students by SES

		MID SES			
		Average Scale Score	Standard Deviation	T value	Probability
Vocabulary Subtest	WTR (N = 63)	447.46	40.43	5.10	.000*
	non-WTR (N = 67)	400.18	63.40		
Oral Comprehension Subtest	WTR	478.32	112.60	1.26	2.11
	non-WTR	453.18	115.26		
Total Pre-Reading	WTR	463.35	67.52	2.81	.006*
	non-WTR	427.04	79.54		

		LOW SES			
		Average Scale Score	Standard Deviation	T value	Probability
Vocabulary Subtest	WTR (N = 11)	337.00	95.98	.53	.600
	non-WTR (N = 10)	318.90	55.68		
Oral Comprehension Subtest	WTR	346.72	121.76	.63	.538
	non-WTR	313.30	122.12		
Total Pre-Reading	WTR	342.27	100.92	.66	.518
	non-WTR	316.40	78.38		

* This difference is statistically significant.

Figure 1. CTBS Total Pre-Reading Percentile Ranks for WTR Schools 1984-1987



It should be noted that the most significant increases in reading achievement and writing performance were obtained by male kindergarten students using WTR. When comparing male to female kindergarten students within the WTR group, there are no significant differences in reading achievement or writing performance. When comparing male to female kindergarten students in the comparison group (non-WTR), female kindergarten students performed at a significantly higher level than male kindergarten students. WTR seems to have a significant effect on improving the reading achievement and writing performance of male kindergarten students.

4.0 CONCLUSIONS AND RECOMMENDATIONS

This section includes conclusions about the 1986-87 Writing to Read pilot study and recommendations for its continuation. Conclusions are based on data reported in Section 3.0 of this document, and are presented first. An overall program statement is followed by results for the specific evaluation questions. Recommendations resulted from synthesis of all data and knowledge of the context in which the program was implemented.

4.1 Conclusions

Overall. Writing to Read was piloted in the kindergarten classes of four elementary schools in Hillsborough County in 1986-87. The pilot program involved 16 teachers and approximately 450 students. The program appeared to be implemented as intended. Its implementation resulted in improved reading achievement and writing performance for the students involved.

Implementation. Almost all teachers, aides and administrators expressed support for the program and stated that their students appeared to be benefitting from it. Although some site-specific problems existed, they seemed to be related to school or personnel constraints rather than major program limitations. Reported strengths were many and included students being motivated to write and read daily, being aware of the integration of reading, writing and spelling, and enhancement of students' self-concept.

Reading Achievement. When compared to their matched counterparts in non-WTR schools, WTR students showed significant increases in reading achievement as measured by CTBS, Form U, Level A.

Writing Performance. When compared to their matched counterparts in non-WTR schools, WTR students showed significant increases in writing performance as measured by a standardized writing sample.

Sex Category Differences. The most significant and consistent increases in reading achievement and writing ability were observed for male kindergarten students using WTR. WTR seems to have a significant effect on improving males' academic performance.

Teachers' Attitudes. A majority of teachers involved in the WTR pilot program reportedly liked the program, thought it was effective with students, and felt their students were reading better and writing better than in previous years.

Parents' Attitudes. Parents overwhelmingly favored the WTR program. A vast majority of parents reportedly liked the WTR program and hoped their child's school would continue to use the program.

4.2 Recommendations

- Writing to Read should be maintained in present locations and, if long-term effects provide justification, expanded over the next three years to include all elementary schools in Hillsborough County. The current evaluation has shown WTR to be especially effective in increasing the writing performance and reading achievement of males. Approximately 1,720 students, 61 percent of whom were male, were retained at the end of the first grade in 1986-87. It has been estimated that the per pupil expenditure for retention is $3,000. Therefore, the cost of this year's retention group will be $5,166,000. This monetary cost is apart from the loss to student self-esteem, for which there is no price tag. It should be noted also that the social-emotional and academic factors associated with retention in primary grades are highly correlated with later dropout rates. In addition to the possible long-term cost-effectiveness of WTR as a preventive intervention, WTR affords kindergarten students an opportunity to be involved in computer technology at the beginning of their public school experience. With computer literacy scheduled to become part of the Statewide Student Assessment Test (SSAT), WTR would assist in preparing students for mastery of such skills. Given the extraordinary gains noted in reading achievement for Just and Oak Park students, it may be advisable to give first priority for WTR labs to low-SES kindergartens.

- Continued evaluation of WTR is recommended. The second year's evaluation should focus on comparison of the retention rate of WTR vs. non-WTR students at the end of the first grade. Comparison of DEES referral rates between the two groups should also be emphasized. Long-term effects should be closely monitored.

- To ensure continuity of creative writing habits of students begun in kindergarten, training in WTR should be provided for first grade teachers. First grade teachers should also be encouraged to realign their expectations for entering WTR students and to be flexible in their placement decisions for the first grade reading series.

- All training in WTR should include visitation in a functioning lab. Regularly scheduled support meetings should also be organized for teachers in the first year of implementation of the program at a particular school.

- Consideration should be given to providing additional funds to each school with a WTR lab to purchase consumable materials required for proper program implementation. A portable classroom should also be provided when a school does not have an extra classroom in which to locate the lab.